

The poster for the GLAST-LAT International Collaboration Meeting is a vertical rectangle. At the top left is a small logo of the Colosseum with the text 'GLAST - LAT International Meeting Roma Sept. 15-18 2003'. Below this is a satellite image. To the left of the main image is a vertical strip of flags: France, Germany, Italy, Japan, Sweden, and the USA. The main image is a photograph of the Palazzo Corsini in Rome, with a large, vibrant image of a spiral galaxy superimposed over the sky. Below the photograph, the text 'ACCADEMIA NAZIONALE DEI LINCEI' and 'Palazzo Corsini - Via della Lungara, 10 - Roma' is printed. At the bottom, there is a row of logos for the sponsors: NASA, the Accademia Nazionale dei Lincei, INFN, and others.

GLAST-LAT International
Collaboration Meeting

Roma, Sept. 15-18 2003

ACCADEMIA NAZIONALE DEI LINCEI
Palazzo Corsini - Via della Lungara, 10 - Roma

Sponsored by:

NASA

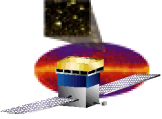
INFN

GLAST Large Area Telescope:

Data Challenge Overview Rome Collaboration Meeting September 2003

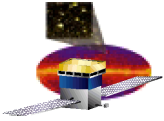
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Outline

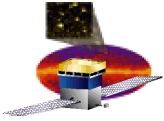
- **Data challenge purposes and scope**
- **Approach – a progression of data challenges**
- **Boundary conditions, preparatory work**
- **Schedule**
- **Overview of session**
- **Summary**



Purposes of the Data Challenges

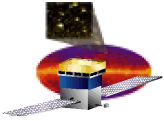
- **“End-to-end” testing of analysis software.**
- **Familiarize team with data content, formats, tools and realistic details of analysis issues (both instrumental and astrophysical).**
- **If needed, develop additional methods for analyzing LAT data, encouraging alternatives that fit within the existing framework.**
- **Provide feedback to the SAS group on what works and what is missing from the data formats and tools.**
- **Uncover systematic effects in reconstruction and analysis.**

Support readiness by launch time to do all first-year science.



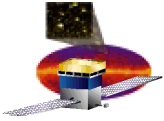
Data Challenge Planning Approach

- **Walk before running: design a progression of studies.**
 - **DC1. Modest goals. Contains most essential features of a data challenge (see following slides).**
 - **DC2. More ambitious science goals. Encourage further development, based on lessons from DC1.**
 - **DC3. Support for flight science production.**



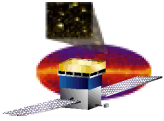
Data Challenge Progression

- **DC1**
 - **modest goals:**
 - 1 simulated day all-sky survey simulation (3M bkgd+gamma events to ground, => 400M generated events)
 - find flaring AGN, a GRB
 - single-day point source sensitivity. daily quicklook analysis development.
 - recognize simple hardware problem(s)
 - a few physics surprises
 - exercise:
 - exposure, orbit/attitude handling, data processing pipeline components, analysis tools
 - use existing recon, bkgd rejection and instrument response to show the problem areas that need improvement. secondary goal (not required) is to prototype improvements
 - **baseline schedule:**
 - Sept-Oct startup problems resolution.
 - Nov-Dec high-level tools beta testing. Finalize instrument response functions.
 - Dec 15 high-level tools release, workshop.
 - mid-January: interim reports (vrvs or face-to-face)
 - Feb 2004 closeout, and plan for DC2 (see later slides).
 - Then, break for flight I&T start. Use the time for fixing problems learned in DC1, software advances, etc.



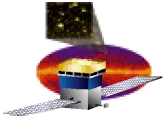
Boundary Conditions, Preparatory Work

- **Very large effort during the past ~6 months (see Tracy Usher's talk):**
 - geometry reviews
 - underlying physics problems in G4
 - onboard filter embedded
 - general infrastructure
 - **Debug everything (keep doing this !!)**
 - source fluxes (still a bit more in Sept/early Oct)
- **Instrument analysis:**
 - done previously with earlier tools for AO, PDR, etc., demonstrating LAT meets requirements. Now ready to do again with new tools.
 - pieces in place: geometry, underlying physics, and subsystem (tracking, PSF, energy) analyses stable
 - background rejection, performance evaluation and parameterization close
 - See Bill Atwood's talk
 - huge effort. gone through first iteration. more work to do; path is clear.
- **Science tools**
 - See talks by Richard Dubois and Pat Nolan
- **Effort to plan DC schedule in context of other work:**
 - Reviews...
 - EM support
 - Other calibration planning and development
 - Construction, Integration, and Test planning and execution



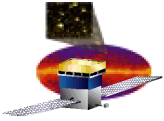
DC Progression

- **DC2 (preliminary!)**
 - more sophisticated goals:
 - 1 simulated month all-sky survey simulation (100M bkgd+gamma events post-filter. Method TBD) PLUS 1 simulated year of gammas
 - find AGN, bursts, pulsars
 - produce a toy 1-month catalog
 - detailed point source sensitivity and localization analyses
 - recognize more subtle hardware problems
 - a few more physics surprises
 - exercise:
 - exposure, data processing pipeline, analysis tools, quicklook. benchmark processing times, data volume, etc. connect to SSC.
 - use updated recon, bkgd rejection and instrument response to show the problem areas that need work. encourage improvements

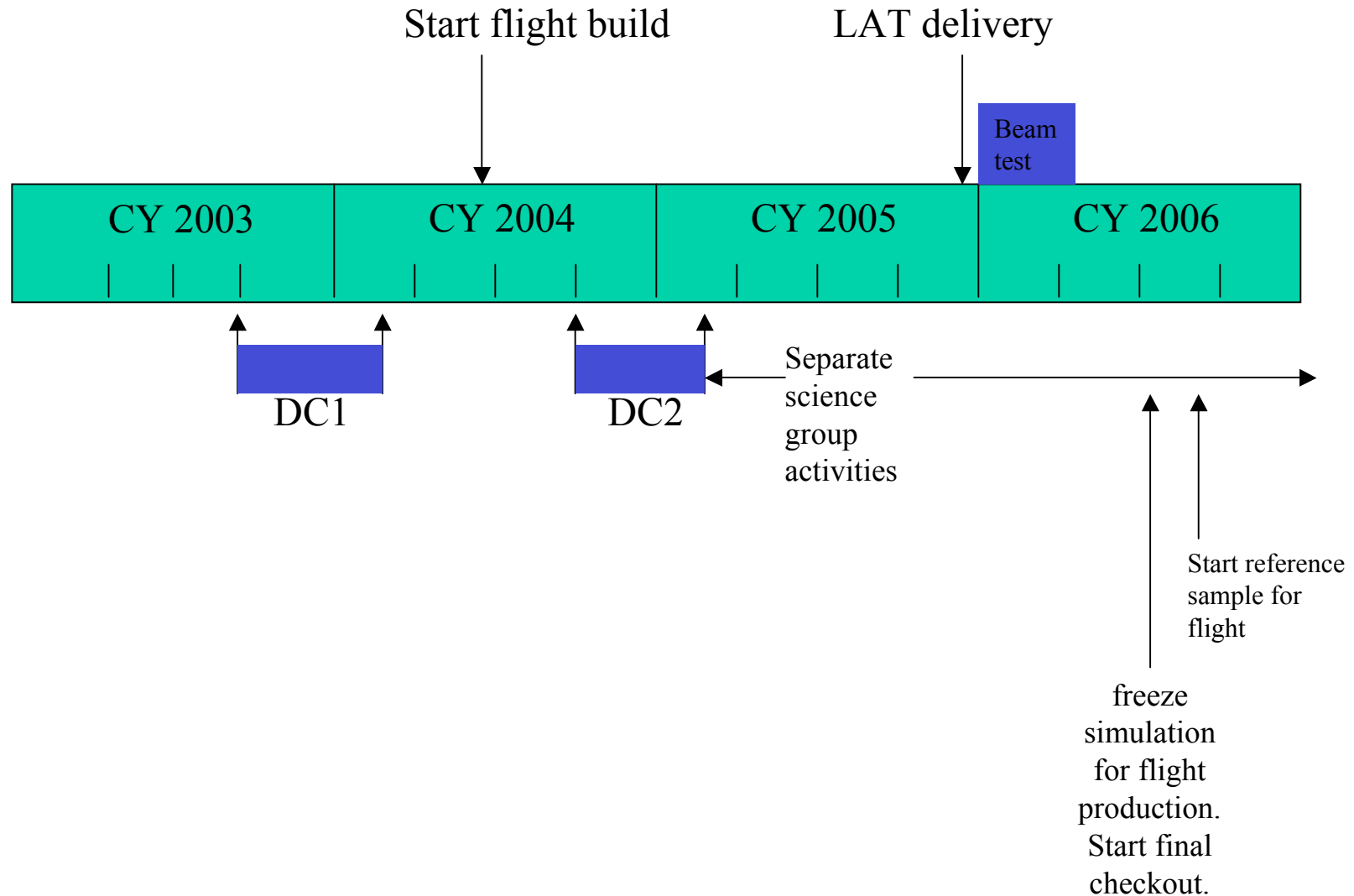


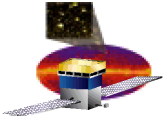
DC Progression

- **“DC3” – Flight Data Challenge! Preliminary plan.**
 - physics groups will have been working on detailed analyses, based on experience with DC2, during the previous year.
 - main goal is realism to support running experiment analysis:
 - 1 full simulated year of data (methods TBD)
 - exercise everything: format data as it comes into the IOC. also confirm data storage, backup, processing speed. will be the reference sample for 1st year data analysis.
 - connect to SSC
 - demonstrate point source sensitivity and localization
 - recognize a few very subtle hardware problems. recognize a few realistic daily hardware problems -> feed to IOC and FSW.
 - physics surprises
 - use updated recon, bkgd rejection and instrument response. this will be our initial science performance. by this time, physics analysis groups should be up and running.



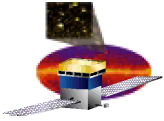
Data Challenges Schedule Summary





Implementation

- **A small, international organizing committee will be put into place by Peter for DC1. Each person on the committee will have a clearly defined set of responsibilities for coordinating and overseeing the components of the work.**
- **The organizing committee will have a well-defined, prioritized list of plots and other results to be produced by data challenge participants.**
- **Review lessons from DC1, and re-evaluate scope and schedule for DC2 (and DC3) as appropriate.**



Session Agenda

- **Simulation and recon status** - Tracy Usher
- **Science tools overview/status** - Richard Dubois
(for Seth Digel)
- **Instrument response studies** - Bill Atwood
- **GLEAM tuple and event display** - Leon Rochester
- **Using the science tools** - Pat Nolan